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CHARLES WILLISON JOHNSON
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ENTOMOLOGICAL NEWS

VOL. XLIV. OCTOBER, 1933 No. 8

On the Nicolay and Weiss "Synopsis of the Cicindelidae" (Coleop.).

E. GRAYWOOD SMYTH, Hacienda Cartavio, Peru.

In supplying our present day systematic Coleopterists with an up-to-date synopsis of the very popular family Cicindelidae, the authors will meet unquestionably an urgent demand. But they are at the same time attempting a very difficult task, and one requiring exceptional judgment in the delineation of species and varieties; for in few other families is so much left to the individual discretion. In a group so very elastic from the multiplicity of highly developed sporadic forms, the taxonomist may easily run amuck.

The authors, while roundly condemning the "splitters and confusionists" and expressing their unwillingness to "condone" certain practices of other workers of established reputation, themselves display a rather empirical method of handling the subject. One surmises that a somewhat better knowledge of the literature on the family, whatever their own experience with the "tigers," would aid them in steering clear of some of the pitfalls. Few of their contemporaries, we fear, can agree with them in the view that the arrangement of a complex group can be simplified by using another's carefully worked out list, and from it "elevating his subspecies to specific rank and considering his varieties and phases as varieties." This is a weak palliative, for in no sense can subspecies within a species be properly considered as having specific identity (they are merely varieties), and few "phases" are deserving of varietal designation.

We are inclined to wonder why the authors have passed over the crepuscular genera in the family, and begun with the most difficult group in the genus *Cicindela*, that of *purpurea*. In studying their key to that group, one very much questions

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whether a student unfamiliar with the group could successfully place a variety by its use. On the other hand, the worker who knows the group will not agree with many of their arbitrary decisions in matters either of rank or position. They may be correct in censuring the making of many synonyms, but are scarcely convincing in their reasons (or lack of reasons) for sinking some names of accepted usage and retaining others.

In the humble opinion of one who has studied the Cicindelidae over thirty years, and who has collected and known intimately more than a hundred of the North American species and varieties, an identification table or key in this family, to be useful, should be planned in conformity with the natural lines of genetic development as indicated by stable taxonomic characters, placing color and maculation as secondary. Doctor Walther Horn, our highest authority on the Cicindelidae, is on record (1, p. 35) as stating, with regard to the family: " . . . Color and design have no specific value at all, and therefore may be entirely left out of the determination tables of the species." Yet we are presented here with a key based almost wholly upon color and maculation. Such a key must necessarily contain inconsistencies and fall subject to criticism, due in the present case to the use of very loosely applied terms to indicate color. A specific instance may be cited. One of the two groupings under (6) is: "Thorax and elytra greenish (rarely both a greenish blue)." This leads to the varieties *propinqua, denverensis* and *pugetana,* which, to call them "greenish," is like calling grass greenish or coal blackish, so very decided is their color. It also leads to *decemnotata,* which may be as correctly considered reddish or copperish as greenish. No two people could agree on such a color as "greenish." The variety *ludoviciana,* most intimately related to *denverensis,* is placed in another grouping under (6): "Thorax and elytra a different color." This is a misleading basis upon which to attempt to separate *ludoviciana* from *denverensis,* since the writer has collected, and has seen in other collections, frequent specimens of *denverensis* in which the elytra were of a different color than the head and thorax, and D. E. Lantz (3, p. 256)

has specifically mentioned having "a *denverensis* with a blue head and thorax." Forms intermediate between *denverensis* and *splendida* have, of necessity, the thorax and elytra of different color. Groupings based wholly upon color are not natural ones, and would lead to endless confusion in the hands of one unacquainted with the family.

We find *cimarrona* considered a valid species, separated, under (2), on the basis of "elytra with marginal line." Those acquainted with the *purpurea* group have decided years ago that *cimarrona* is not entitled to specific rank, and we have the statement of no less an authority than Doctor LeConte that it is not. Dr. F. H. Snow says (6, p. 16) regarding *auduboni* Lec. and *cimarrona* Lec.: "A large series of the last two forms was taken, convincing Dr. LeConte of what he had long suspected, that they should not be considered distinct species." (At the time this was written, in 1877, *auduboni* was considered as including both the green and black forms.) The writer has called attention (5, p. 183) to the same fact in the following words: "*C. cimarrona* has resulted from a fusion of *graminea* and *auduboni*, together with a change of markings, in the high table-lands east of the Rocky Mountains, as shown by a series taken by Doctor Snow in South Park, Colo., which exhibits every possible stage of transition from *graminea* and *auduboni* to *cimarrona*." It is understood, of course, that in this statement *graminea refers* to what is now called *auduboni*, and *auduboni* to what is now considered *nigerrima*. The same fusion of these three varieties may be found in Gallinas Canyon above Las Vegas, New Mexico, and in many other localities.

A definite change in coloration accompanies this fusion, the green and black forms showing a tendency to blend in most specimens into a somewhat browner tone, and to be overlaid with cupreous reflections, that become intensified with an increase of altitude. There is a simultaneous change in shape also, the mountain forms becoming somewhat more elongate, more robust, more convex. As would be expected in a transition, within a restricted territory, from feebly maculate forms

to those with complete markings and marginal band, there are intermediate forms in which the markings are quite complete (corresponding to those of *limbalis*) but are not connected by a marginal band. Some of these forms answer very well to the description of *auguralis* Casey, and may be identical with it. In which case it seems very plain that both *cimarrona* and *auguralis* are varieties of *purpurea*, so that Casey and Leng were both correct in placing *auguralis* as such, contrary to the views of the authors, whose key for the group would require some alteration to accommodate the correction. The proper inclusion of *cimarrona* with the *purpurea* subgroup was well understood by Lantz (3, p. 257), who said: "A study of the habits of the *purpurea* group leads me to recognize two series. The first is represented by *purpurea* and the varieties *graminea, auduboni, cimarrona,* etc. The series has usually a detached, oblique middle band. . . . The other series has the middle band less oblique when complete, but often short and at right angles to the border of the elytron, or even lacking. . . . To it belongs *limbalis, splendida, denverensis,* etc." The writer made up a tabular arrangement of the *purpurea* group (5, p. 184) to show this same division into two subgroups, with eight varieties in each, that would require no correction at the present time except the exclusion of *plutonica*.

The use of the "marginal line" in erecting a species is of very doubtful value in the genus Cicindela, since one can mention other American species and varieties (*pulchra; lecontei; nigrocaerulea*) in which every type of variation from the immaculate to that with markings fused into a marginal vitta can be found, without these forms having received distinctive names that would stand. Furthermore, varieties showing the peculiarity of marginal band are to be found in both the *purpurea* and the *limbalis* subgroups, those in the former all coming under the name *cimarrona*. Those forms of the *limbalis* subgroup displaying the development of a marginal band are also found in Colorado, but they are much more brilliant in coloration and very different in habits from *cimarrona*. Placing importance, as they do, on the marginal line, it is hard to under-

stand how the authors could have overlooked this unusual variety in any study of the *purpurea* group. Doctor Horn (1, p. 31) especially refers to it: " . . . wonderful forms of *purpurea* from Sedalia (red, entire border white; green, the middle band broadly united with the humeral lunule)." And V. E. Shelford, in his brilliant work on Color and Color-Pattern Mechanism of Tiger Beetles, amply illustrates the maculation of the variety on Plate 25, Figs. p to s, and Plate 28, Figs. 508-509 and 516-518. As in *cimarrona*, this variety is exceedingly variable, both in color and markings, the color varying from bright red, or red with green reflections, to occasional brilliant green individuals. The markings are usually complete and rather broadened, often dilated at the margin and partly or entirely fused to form a marginl band, but occasionally are so restricted as to approximate those of *splendida*. The variety reaches its best development on the high table lands between Denver and Colorado Springs, fine series having been collected at Sedalia. Though exceedinly variable, its characteristics of color and markings are so distinctive from all other forms in the *limbalis* subgroup as to justify its proper characterization, both for reference purposes and for cabinet arrangements, and I suggest for it the name *Cicindela sedalia*.

One finds small reason for erecting *splendida* as a species distinct from *limbalis*, and for placing *transversa* under *limbalis*, and *cyanocephala* under *splendida*. This is an attempt to harness one horse of the team backward, and is astonishing in view of their statement (p. 349): "As might be imagined, intermediates are often encountered in Kansas (Argentine) which is apparenly one of the rare localities where both *limbalis* and var. *transversa* and *splendida* and var. *cyanocephala* occur together." It is new to our knowledge that distinct species can have intermediate forms mingling with them in the same locality and retain their specific identity. The writer has years ago (5, p. 180) recorded the occurrence of these four forms together at Topeka, Kansas, and has further shown *transversa* and *splendida* to be one species (5, p. 183): "Specimens of this last were frequently found in copula with typical *trans-*

versa, thus establishing *splendida* as a variety of *transversa,* and so of *purpurea.*" This was at Fern Glen, near St. Louis, Mo.

Again, we hardly agree with the statement that "*denverensis* may be traced through *ludoviciana* as merely another variety of *splendida.*" Why "through *ludoviciana,*" which is a very local and sporadic form? Professor Lantz has shown (3, p. 256) that the distributional boundaries between *splendida* and *denverensis* overlap just as do those between *transversa* and *splendida*: "In four cases I found *denverensis* and *splendida* in copulation, and my friend, Mr. Johnson, of the Ft. Collins, Colo., Experiment Station, has observed similar cases near Denver."

As to the reduction to synonymy of certain varietal names, without a more fundamental reason for doing so in each instance, the habit reveals itself as purely arbitrary. The authors, for example, annul the name *mirabilis,* which is abundantly distinct in form and color, as well as minor characters, from *auduboni,* but retain *ludoviciana,* which is very feebly separable in a large series from *denverensis.* The line of geographical separation between the red-and-green forms (*splendida; cyanocephala*) and the purely green, or blue and green (*ludoviciana; denverensis; propinqua*), inscribes a diagonal line from the northwest across northeastern Colorado and southwestern Kansas, bending eastward through Oklahoma and northeastern Texas to extreme northern Louisiana. There seems little doubt that in time connecting forms will be found between *denverensis* and *ludoviciana* that will sink the latter name to synonymy. On the other hand, the writer has shown (5, p. 183) that "*C. denverensis* occurs in two forms, corresponding to *splendida* and *amoena* in markings, which have not received distinctive names." Since *denverensis* was described as having maculation similar to *splendida,* the green form with complete markings corresponding to those of *cyanocephala* and *limbalis,* and which occurs in company with *denverensis* in the valley of the South Platte, is without proper characterization, and I suggest for it the name *Cicindela plattensis.* It bears to typical *denverensis*

exactly the same relationship that *cyanocephala* bears to *splendida,* or *limbalis* to *transversa,* and is fully as deserving of a name, both for reference purposes and for cabinet arrangements. Like the other fully maculate varieties (*limbalis; cyanocephala*), in the more northern extension of its range it sometimes occurs to the almost exclusion of its sister form, *denverensis.* It should not be confused with *pugetana,* which is perhaps more properly associated with *decemnotata,* although the key of the authors does not make this very clear.

The placement of *purpurea* and all of its close derivatives in a key under "thorax, head and elytra always the same or about the same color" is misleading, since some western varieties, such as *mirabilis,* have the head and thorax distinctly red or cupreous and the elytra quite green. To be useful to a student of this family, a key to its varieties should delineate and delimit groupings more closely.

Excluding only the forms of *decemnotata,* which is admittedly entitled to specific standing, the remainder of the *purpurea* group has all too evidently sprung from two stem forms, *purpurea* and *limbalis.* The genetic development of the group has taken two distinct and very divergent directions in its movement westward across the continent, which would seem to justify the separation of the group into two species. In habits also the two subgroups have diverged, those from the *purpurea* stock preferring open meadow roads or prairie, those from *limbalis,* clay banks or hilly clay roads. Whether this separation into two species is really justifiable rests, it seems, upon the one vital question: Do *purpurea* and *limbalis* ever occur together, and interbreed, in the Eastern States? (In the West we know that they do not.) This point has never been made clear to our knowledge. If they do interbreed, all varieties in the group (excepting *decemnotata* and possibly *pugetana*) should be thrown into one species; if they do not, the group can stand, as now considered, a complex of varieties of two species, *purpurea* and *limbalis.* Let the collector who is so placed as to find the two stem forms together decide this question.

Most of us are agreed that the acid test by which to deter-

mine whether two related forms that occur together are the same or separate species is whether or not they interbreed and give rise to intermediate forms, no matter what their similarity in structure may be. To determine this point in the Cicindelidae is comparatively easy because of their bold diurnal habits. The application of this test has separated *scxguttata* and *patruela,* that were once considered varieties of one species; likewise has separated *formosa* and *lengi.* It has kept together the rather dissimilar *repanda* and *duodecimguttata,* and the even more dissimilar Mexican *hydrophoba* and *quinquenotata.* The same test has definitely established *cuprascens* and *macra* as distinct species (4, p. 427), in spite of their frequent erroneous placement as varieties of one species by those not personally acquainted with their habits.

The references included here under Literature Cited, all of which papers discuss species of the *purpurea* group, will supply a few of the omissions from the Bibliography of the authors. Most of them will be found in Mr. Leng's able and complete Bibliography of Taxonomic Coleopterology to January 1, 1919, published with his Catalogue of the Coleoptera of America, North of Mexico.

LITERATURE CITED.

(1) HORN, WALTHER. 1903. Letters of a Traveling Entomologist. Published by Warren Knaus, Press of Democrat-Opinion, McPherson, Kansas, pp. 1-44.
(2) KNAUS, WARREN. 1900. The Cicindelidae of Kansas. Canadian Entomologist, XXXII, pp. 109-116.
(3) LANTZ, D. E. 1905. Notes on Collecting Cicindelidae. Transactions Kansas Acad. Science, XIX, Topeka, Kans., pp. 252-260.
(4) SMYTH, E. G. 1905. Notes on Collecting Cicindelidae. Trans. Kans. Acad. Sci., XIX, pp. 425-432.
(5) SMYTH, E. G. 1907. Notes on Collecting Cicindelidae—II. Trans. Kans. Acad. Sci., XXI, Pt. I, pp. 180-188.
(6) SNOW, F. H. 1877. List of Coleoptera Collected in Colorado in June, July and August, 1876, by the Kansas University Scientific Expedition. Trans. Kans. Acad. Sci., V, pp. 16-21.
(7) WILLISTON, S. W. 1878. Notes on the Habits of Some of the Rarer Cicindelidae. Trans. Kans. Acad. Sci., VI, pp. 32-33.

A New Alcidamea (Hymenop.: Megachilidae).

By T. D. A. COCKERELL, University of Colorado.

Alcidamea brachyodonta n. sp.

Male. Length about or nearly 6 mm., anterior wing about 3.8 mm.; black, with pale hair, dense and rather dull white on face, white and thin on cheeks and pleura, very dense and faintly fulvescent on middle of front, faintly fulvescent on thorax above, the fringe on scutellum erect and very long; eyes black; scape stout and black; flagellum beyond about the third joint clear ferruginous beneath; and the apical half clear red on both sides, the apex with the usual spiniform termination; mesothorax finely punctured, shining between the punctures; scutellum and base of metathorax shining; tegulae dark reddish; wings somewhat dusky, especially in the apical field, stigma and marginal vein dark, the other veins pale brown; second cubital cell receiving first recurrent nervure very near its base, and the second more than twice as far from the apex; basal nervure falling short of nervulus; legs black, with sparse white hair, the tibiae at end, and the small joints of tarsi, rufescent; abdomen finely punctured, shining, with five rather dull white hair bands, the first two broadly interrupted; apex produced and broadly rounded, a small tooth at each side of sixth tergite; second sternite with a rather small erect denticle.

Habitat: Pasadena, CALIFORNIA. Charles H. Hicks, 2156. *A. colei* Crawford, from Redlands, is even smaller (male about 5 mm.), with brown antennae, and the apex of the abdomen is pointed, as in *A. producta* Cresson. The California *A. grinnelli* Ckll. is much larger, and differs in many respects, such as the venation, the structure of abdomen, and the green eyes.

Changes at the Academy of Natural Sciences of Philadelphia.

The Academy of Natural Sciences of Philadelphia announces the following staff changes made by the Board of Trustees:

Mr. William J. Fox, for many years Assistant Librarian, was appointed Librarian.

Mr. Morgan Hebard, formerly Curator of the Department of Entomology, wishing to be relieved of all administrative duties and to devote his time more fully to the care and study of his personal collection, resigned as Curator and was appointed a Research Associate in the same department.

Mr. James A. G. Rehn, formerly Associate Curator of the Department of Entomology, was appointed Curator of the same department to succeed Mr. Hebard.

Observations on a Chrysid Parasite and its Host (Hymenop.: Chrysididae, Megachilidae).

By CHARLES H. HICKS, University of Colorado.

Not a great deal is known concerning the early stages of chrysid larvae and their host relationships. This applies particularly to American species. It is rather generally believed that the young chrysid feeds only on the larva of the host although Chapman * has shown that some species, at least, first destroy the small, host larva and later eat the stored provisions of paralyzed caterpillars. A review of Chapman's paper, and certain others of importance, is given by Sharp in the Cambridge Natural History, vol. VI, pages 3 and 4, 1899. In the instances where the host is a bee, hence a pollen feeder, the chrysid either waits until the bee larva has grown before it attacks it or, as in a record by Ferton ** (and possibly others), the parasite is said to actually consume pollen and honey while waiting for the bee larva to develop or to reach sufficient size.

During the Spring of 1928, at Pasadena, California, the writer was fortunate in securing two nests of bees, each containing chrysid larvae. The chrysid involved is *Chrysis* (*Holochrysis*) *pacifica* Say or an unnamed variety or race of *pacifica*. This determination has been made by Dr. Leland H. Taylor to whom I am pleased to express my appreciation for this and other favors. Certain data concerning the development of the chrysid, together with notes on the host, follow:

The host from one nest proves to be that of a new species which Dr. Cockerell has described as *Alcidamea brachyodonta*, the description of which is published in this issue of the NEWS. The nest from which this specimen has been reared was taken at Pasadena, California, on May 28 and contained 4 completed cells. The builder and provisioner had but recently constructed a barricade to the outside and above the series of cells. The outer part of the barricade consisted of a plug, concave in outline as seen from above, formed of greenish and brown plant material and a few small pebbles, about one millimeter in thick-

* Chapman, T. A. "On the Oeconomy of the Chrysides parasitic on *Odynerus spinipes*." Ent. Monthly Mag., vol. 6, pp. 153-158, 1869.

** Ferton, Ch. "La Vie des Abeilles et des Guêpes." Chiron, Paris. 1923.

ness. The plant substance composing it was thought to have been obtained in part, at least, from lichens. Below, a space measuring some 24 mm. in length had been filled with loose pebbles. A support or partition of plant material held these pebbles from falling upon the content of the first cell (last to be constructed).

The first cell was 6 mm. long; 2nd, 13 mm.; 3rd, 8 mm.; and the 4th, 12 mm. in length. Between the first and the second cell, some pebbles had been used with the plant material in the partition; between the others, the partitions were thinner and consisted solely of a greenish substance. The content of the lowest cell rested on the concave base of the pith of the plant stem. Each cell contained some pollen and a larva of the host bee, *A. brachyodonta,* but the size of the larva was progressively larger and the amount of food increasingly less in the cells from one to four.

Each host larva had a small, parasitic, chrysid larva on its body. These parasites were of about the same size and remained attached to the hosts, although the latter were jarred considerably. At this time, just after the nest had been taken, the parasites were oriented as follows: No. 1 was on the segment just anterior to the mid-body region of the host, with its head toward or attached at a nearly dorsal position; No. 2 was on the 4th from the last segment with its head toward the dorsal region of the host and with its tail touching the pollen in the cell; No. 3 was on the 3rd segment from the last of the host and in a position similar to that of No. 2 except that it rested entirely on the host; No. 4 was like No. 3 but was attached midway between the head and tail of the host. The entire nest was placed in a test tube containing a cotton plug for a stopper. Certain facts of development and of larval reactions were subsequently observed and recorded.

Two days after the nest had been taken from the field, all the host larvae had grown much larger, those in the last two cells (numbers 3 and 4), having nearly finished their provisions. The chrysid larvae, changed in position on the host body, remained practically the same in size. During the afternoon of the following day, the host from the 4th cell began to spin its cocoon. This was after it had finished passing feces,

and apparently following complete evacuation of the digestive tract. These pellets had been plastered to the side of the small vial to which the host and parasite had been transferred following the period of feeding. Normally the feces would have been placed at the ends of the cell and outside the cocoon of the insect.

During the period of feeding of this specimen and that of the others of the nest, food and atmospheric conditions were kept moist. This was accomplished by placing periodically within the test tube enough fresh leaves to furnish sufficient moisture. The cotton stopper aided in preventing too rapid evaporation and allowed for an exchange of gases for respiration. This method, when properly regulated, keeps the pollen moist and provides better conditions for larval growth and development. It may be used to advantage where regulated moist chambers cannot be had.

The host larva, in spinning, attached its silk to cotton placed in the vial but it was unable to enclose itself in a cocoon, due to the large size size of the tube. This failure had been planned in order that the spinning would be dissipated and that with the host and parasite in view at all times. Thus when finished on the following day, a bed of silk lay beneath the larva and none at the side or above it.

During the active movement of the host while spinning, the parasite held on, seemingly shifting its position as the need for it arose. This was true likewise when the host was forced to tumble out onto my hand or when rolled back into the vial. It appeared that the chrysid larva held onto the host by means of its jaws, supplemented at times by the contact of the posterior end of the body. A dark spot in the center of the body indicated that it had probably fed a little although active feeding did not take place until the host had completed its work. Then it fed noticeably and actively until the tissues of the host were exhausted, spun its cocoon successfully (since cotton for a side attachment had been provided) and later in the laboratory completed its development. It emerged during the early winter a mature chrysid, *Chrysis* (*Holochrysis*) *pacifica* or an unnamed variety or race of *pacifica*.

The parasite from one cell was removed from the host and mounted on a slide in balsam. A sketch of it accompanies this article as well as that of the adult larva from another.

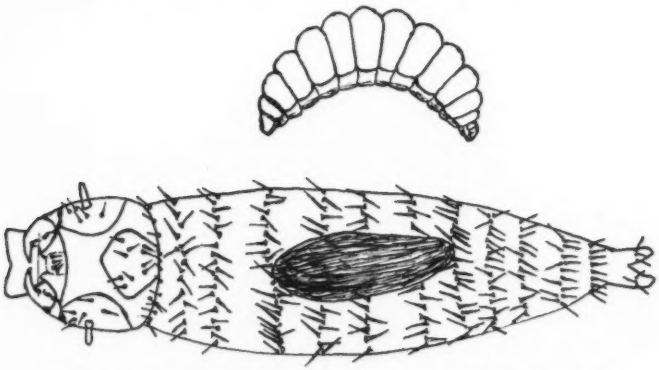

FIG. 1 Mature chrysid larva removed from cocoon. Anterior end is to the right. x 10.
FIG. 2. Sketch of first instar of *Chrysis (Holochrysis) pacifica* Say or an unnamed variety of *pacifica*, parasite of *Alcidamea brachyodonta* Ckll. Dark, central mass represents ingested food. x 85.

From still another host of this series, the young chrysid was forcibly removed and placed on the paralyzed, moth larva, prey of the wasp, *Podalonia violaceipennis* form *luctuosa*. It, however, did not attack this prey and later perished.

A second nest, believed to be that built by a species of bee belonging to the genus *Ashmeadiella*, likewise contained chrysid larvae. These parasitic larvae appeared very like those from the nest of *A. brachyodonta* and their reactions and relationships quite similar. It is hoped that the host from this nest may be identified and the data later presented. The parasite from one cell in this series was found at one time on the food mass.

It seems probable that the adult female chrysid seeks the nest and cell of the host (or hosts) and lays her egg therein. The larva then, upon hatching, attaches itself to the host and remains with little or no food until the host has reached a late larval or prepupal stage before attacking it. In nine instances, only one chrysid larva was found to a given host larva thereby suggesting that usually but a single fertile egg is deposited in a given cell.

Two New Species of Calendra (Col.: Curculionidae.)

By A. F. SATTERTHWAIT, U. S. Bureau of Entomology.

The following species have been unearthed through the generous cooperation of Mr. Henry Dietrich, formerly inspector in the Mississippi State Plant Board, with the Webster Groves Station of the Bureau of Entomology in its investigation of the corn billbugs.

Calendra dietrichi, new species.

Front tibia narrowing toward apex, the outer edge, at the spot where the outer apical angle usually appears, not in the least angulate or lobed, but evenly merging into the terminal claw or uncus; third joint of each tarsus one-third to one-half wider than basal joint.

Pronotum without actual vittae; median line narrow, polished, impunctate, almost contacting base and apex; punctures circular, wide, shallow, heavily coated, only moderately variable in size, smallest at basal edge and at apical collar, some of them confluent near base on each side of the median line and in the posterior outer angles of the disk; all punctures of one type, each with an erect central seta slightly projecting. A small polished area, large enough to accommodate about two punctures, slightly cephalo-laterad of middle of each half of disk.

Beak moderately compressed, ventro-apical angle less than 90 degrees, apex above slightly concave, upper contour almost flat, very slightly convex from base past scrobes, then slightly concave, then convex, then straight for apical fourth; flattened portion at base with thoracic type of punctures from eye to eye, and extending slightly on to the head and part way laterad along eyes like eyebrows, except for a narrow, transverse, polished, impunctate area caudad of interocular puncture. Interocular puncture inconspicuous at base of long, wide depression.

Elytra thinly and generally covered with yellowish gray coating. Intervals flat, basal portion of third slightly elevated. Sutural interval uniseriately punctate, about 22 punctures in basal half; the second interval with 12 punctures in basal half not closely set and somewhat larger than those on sutural interval; the third with about 30 in basal half, those in basal third irregularly biseriate or uniseriate, balance uniseriate. Striae open, punctures large, 8 in basal half of first stria, 6 in basal half of second, the punctures in the apical half not conspicuous.

Pygidium bearing long, untufted setae across the apical third.

Last sternite setaceous, with tufts as long as the pygidial setae. Other ventral punctures generally like those of thorax, each with a slightly projecting seta.

General color dark grayish brown with yellowish gray coating in depressions. Measurements in millimeters: Female, total length 9.23; width of beak at middle 0.47, at apex 0.52, at base 1.06, least depth about 0.70, length 2.96; pronotal width 3.60, length 4.13, humeral width 3.80, elytral length 4.50.

The female *type* was reared from a larva in rice stubble from Wiggins, MISSISSIPPI, March 4, 1932, submitted by Mr. Henry Dietrich; the adult issued April 6 (Webster Groves No. 32002). Another female, collected in the adult state under chips at Delchamps, ALABAMA, December 13, 1931, by Mr. Dietrich (Webster Groves No. 31155), is almost exactly like the female type except that its feet are almost devoid of setae, and to this denuded condition is attributed the fact that the third tarsal joint of each foot appears somewhat inflated, at least 1½ times the width of the basal joint. The rostrum of the Alabama specimen has two concave spaces in the dorsal curve. The Alabama specimen differs also in that the polished impunctate area at the base of the beak extends completely across from eye to eye.

Through the courtesy of Mr. Henry Dietrich the type is deposited in the U. S. National Museum (Cat. No. 44807).

This species more closely resembles *C. germari* Horn than *C. chittendeni* Blatch. It differs from *germari* in having the lower apical point of the rostrum acute, in having a partial differentiation between the rostrum and the head, in having no notable irregularity in the sculpturing of the pronotum, and in having elytra with prominent wide open striae, fewer and much smaller strial punctures, much finer punctures on intervals, and more sharply defined intervals.

It differs from *C. chittendeni* in having the basal portion of the rostrum closely beset with large coated punctures and in the absence of a fovea in front of the eye, in having only a narrow smooth line on the disk of the pronotum and only one style of puncture, and in having much closer punctures on flat, square-shouldered elytral intervals.

Calendra lucedalensis, new species.

Tibia not truncate, broadly rounded or lobed at outer apical angle; all tarsi slender, the joints about equally wide. Elytral intervals flat and even, striae fine and shallow; strial punctures large, about twice as long as wide, shallow, about 12 to 16 in the first stria. Even intervals about equal. Punctures on intervals fine, uniseriate, except at base of third, where they are irregular. Coating even, though less opaque toward base of seventh and eighth intervals, apparently from abrasion.

Pronotum without actual vittae though there are slight depressions with large, more or less confluent punctures from the middle of the base forward and outward, practically lost before reaching middle. A slight depression with congested large punctures near center of each basal quarter. Median line less than half the thoracic length, moderately wide, impunctate in the center, failing to reach base and apex by about equal distances. Pronotum more clearly black than the elytra, yet lusterless or nearly so. Collar fold at apex not obvious across the median line.

Beak compressed, its depth at apex double its thickness at middle, flattened above at base, moderately curved with a fossal bump near base above, and about a 25 degree bend near apex. Apex above concave; below, about a 95 degree angle, not rounded. Interocular puncture deep, circular, without canal. Metasternum with a few very coarse punctures, some confluent. Punctures coarse on sternite 1, deeper on 5, moderately fine on 2, 3 and 4. Sternites shiny, without obvious setae. Pygidium coarsely, not very densely, punctured, with a slight median elevation indicated at the apex. Pygidial setae all very fine, short.

General color blackish-brown with scant yellowish-gray coating.

Measurements in millimeters: Female, total length 11.25; width of beak at middle 0.38, at base 0.76, length 3.55; pronotal width 3.13, length 4.43, humeral width 3.96, elytral length 5.01.

Type locality, Lucedale, Mississippi, June 22, 1932. Found dead by Mr. Henry Dietrich.

Described from one specimen in very good condition.

Through the courtesy of Mr. Henry Dietrich the *type* is deposited in the U. S. National Museum (Cat. No. 44808).

This species is somewhat suggestive of *scoparia* Horn, especially those specimens of the latter species in which the pronotal irregularities are at a minimum. The elytral pattern is quite distinctive; this and the character of the front tibiae and

the slenderness of the tarsi separate it from most of the species of the eastern and central states, and indicate nearness to *C. cicatistriata* (Fahr.) (*ulkei* Horn). There are slight serrations in the tibiae but they are not nearly so strong as in *C. serratipes* Chitt.

The Marloff Collection of Insects.

The late Mr. Fred Marloff, Jr., bequeathed his entire collection of insects with the cabinets to the Carnegie Museum. This is the largest and the most valuable bequest ever received in the Section of Entomology. The collection contains 27,000 specimens mostly from United States and Canada. Mr. Marloff's beautful collection of Micro-Lepidoptera had already some years before been acquired by this museum through the generosity of Dr. George H. Clapp. Mr. Marloff until his death preserved the greatest interest in the Carnegie Museum, and he used to express his desire to the curator, that his collection would be there preserved. This collection will always stand as a monument of this gentle, true, and spirited lepidopterist. 34th Ann. Rep. Carnegie Mus. 1931:31.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞*Note the change in the method of citing the bibliographical references, as* **explained above.**

Papers published in the Entomological News are not listed.

GENERAL.—Adkin, R.—The light-trap as an adjunct to the exploration of a fauna. [9] 66: 123-129. **Barber & Wade.**—Note on a collection of old entomological paintings. [6] 41: 101-103. **Bequaert, J. C.**—Contribution to the

entomology of Yucatan. [Carnegie Inst. Washington] No. 431: 547-574, ill. **Cockerell, T. D. A.**—The Brazilian collections of H. H. Smith. [6] 41: 54. **Ewing, H. E.** Some peculiar relationship between ectoparasites and their hosts. [90] 67: 365-373. **Gilmore, R. J.**—Life in mountain waters. [Colorado Coll. Publ.] 1933: 28 pp., ill. **Hering, M.**—Morphologische Untersuchungen in der Gattung Parnassius (Lepidopt.) als Beitrag zu einer Kritik am Begriff der Unterart [Mitteil. Zool. Mus. Berlin] 18 (3): 273-318, ill. **Jacot, A. P.**—Examination of the reverse side of micromounts. [68] 78: 128-129. **Lal Hora, S.**—Silken shelters of torrential insect-larvae. [Current Sci.] 1: 341-343, ill. **Lindner, E.**—Ueber die präparation von Dipteren und Hymenopteren. [Museumskunde] 5: 73-78, ill. **Osborn, H.**—Entomological centenaries. [7] 26: 201-202. **Phillips, E. F.**—Insects collected on apple blossoms in western New York. [47] 46: 851-862. **Richards, O. W.**—The centenary of the Royal Entomological Society of London. [Sci. Progress, London] 28: 52-60. **Soffner, J.**—Insektenleben und menschliche kultur. [17] 50: 160-162, cont.

ANATOMY, PHYSIOLOGY, ETC.—Bacelar & Frade.—Sur la longévité chez les Araignées. [77] 113: 523-524. **Baker & Arbuthnot.**—The application of artificially prolonged hibernation of parasites to liberation technique. [7] 26: 297-302. **Beams & King.**—The intracellular canaliculi of the pharyngeal glands of the honeybee. [92] 64: 309-314, ill. **Biron, M. and Metalnikov, S.**—Études sur l'immunité des chenilles de Galleria mellonella envers les Bacilles tuberculeux. [C. R. Soc. Biologie, Paris] 113 (25): 1050-1052. **Brolemann, H. W.**—Les segments thoraciques chez les Diplopodes-Chilognathes (Myriapodes). [Bull. Soc. Hist. Nat. Toulouse] 64: 471-482. **Dingler, M.**—Das stridulationsorgan von Crioceris. [97] 52: 705-709, ill. **Douglas, J. R.**—Additional information on precipitation as a factor in the emergence of Epilachna corrupta from hibernation. [84] 14: 286-297, ill. **Duncan, P. M.**—The muscles and the nerves of the ovipositor of Anax junius. [1] 59: 145-157, ill. **Dyal & Nath.**—On the nature of the "Yolk-Nucleus" of spiders. [Jour. R. Micros. Soc.] 53: 122-128, ill. **Ellsworth, J. K.**—The photoreceptive organs of a flesh fly larva, Lucilia sericata: an experimental and anatomical study. [7] 26: 203-215, ill. **Fulton, B. B.**—Inheritance of song in hybrids of two subspecies of Nemobius fasciatus. [7] 26: 368-376. **v. Gebhardt, A.**—Zur anatomie des geschlechtsapparates der Buprestiden. [Bull. Soc. Sci. Nat. Maroc.] 12:

104-118, ill. **Gerould, J. H.**—Orders of insects with heart-beat reversal. [92] 64: 424-431. **Giordani-Soika, A.**—Osservazioni sul colorimento della ninfa imenotteri. [Mem. Soc. Ent. Italiana] 11: 206-219. **Grandi, G.**—Morfologia ed etologia comparata di insetti a regime specializzato. [Bol. Lab. Ent. R. Ist. Sup. Agrar. Bologna] 5: 143-305, ill. **Grandjean, F.**—Observations sur les organes respiratoires des Oribates [Acariens]. [25] 38: 123-127. **Henke, K.**—Zur vergleichenden morphologie des zentralen symmetrie-systems auf dem schmetterlings-flügel. [97] 53: 165-199, ill. **Hertz, M.**—Ueber figurale intensitäten und qualitäten in der optischen wahrnehmung der biene. [97] 53: 10-40, ill. **Hilton, W. A.**—The senses of spiders. [13] 25: 21-31, ill. **Howell & Usinger.**—Observations on the flight and length of life of drone bees. [7] 26: 239-246, ill. **Janisch, E.**—Beobachtungen bei der aufzucht von bettwanzen. [Zeit. Parasitenk., Berlin] 5: 460-514, ill. **Jörg, M. E.**—Consideraciones histofisiologicas sobre los ojos de los insectos (Polybia scutellaris y euterme). [104] 5: 93-102, ill. **Kirchner, Z.**—Comportement de l'appareil de Golgi et du vacuome pendant la spermatogenèse chez Aphrophora salicis. [77] 113: 1293-1295, ill. **Koch, A.**—Ueber das verhalten symbiontenfreier Sitodrepalarven. [97] 53: 199-203, ill. **Koltzoff, N. K.**—Ueber die kunstliche parthenogenese des seidenspinners. [97] 52: 626-642. **Lartschenko, K.**—Die unempfänglichkeit der raupen von Loxostege sticticalis und Pieris brassicae gegen parasiten. [Zeit. Parasitenk., Berlin] 5: 679-707, ill. **Lengerken, H.**—Ueber bilaterale und pseudo-fühler heteromorphose unter natürlichen bedingungen. [97] 53: 1-10, ill. **Lins de Almeida, J.**—Nouveaux agents de transmission de la Berne (Dermatobia hominis) au Brésh. [77] 113: 1274-1275. **Lutz, F. E.**—Experiments with "Stingless Bees" (Trigona cressoni parastigma) concerning their ability to distinguish ultraviolet patterns. [40] 641: 26 pp., ill. **Machulka, V.**—Eine modifikation der tötung der insekten mit schwefeldioxyd. [Ent. Nachricht.] 7: 69-70. **MacLagan, S.**—The ecological significance of soil reaction (pH value) in relation to terrestrial animals. [Proc. Roy. Physical Soc., Edinburgh] 22 (3): 107-122, ill. [The insect treated of is the Collembolan, Smynthurus viridis]. **Malouf, N. S. R.**—The skeletal motor mechanism of the thorax of the "Stink Bug," Nezara viridula. [Bull. Soc. R. Ent. Egypte] 1932: 161-203, ill. **Mathis, M. M.**—Utilisation des pontes et des larves de Culicides et de Chironomides dans l'elevage des poissons. [Bull. Soc. Nat. Acclim. France] 1933: 182-185, ill. **Mehta, D. R.**—

On the development of the male genitalia and the efferent genital ducts in Lepidoptera. [53] 76: 35-61, ill. **Metcalf, M. E.**—Notes on the structure and development of the female genital system in Dasyneura leguminicola (Diptera). [53] 76: 89-105, ill. **Nieschulz, O.**—Ueber die bestimmung der vorzugstemperatur von insekten (besonders von fliegen und mücken). [34] 103: 21-29, ill. **d'Orchymont, M. A.**—La respiration des Palpicornes aquatiques. [33] 73: 17-32. **Robinson, W.**—The use of blowfly larvae in the treatment of infected wounds. [7] 26: 270-276. **Russell, E. S.**—A new theory of animal colouration. [Sci. Progress, London] 28: 154-159. **Schindler, P.**—Ueber temperaturversuche in einer sauerstoffatmosphäre. [14] 47: 35-36, ill. **Simanton, W. A.**—Determination of the surface area of insects. [7] 26: 247-254, ill. **Sumner, R.**—Influence of gregarines on growth in the mealworm. [68] 78: 125. **Suster, P. M.**—Das Johnstonsche organ bei den larven holometaboler insekten. [34] 103: 63-65. **Suter, P.**—Untersuchungen über körperbau, entwicklungsgang und rassendifferenzierung der kommaschildlaus, Lepidosaphes ulmi. [41] 15: 347-420, ill. **Tarsia in Curia, I.**—Nuove osservazioni sull'organo simbiotico di Calandra oryzae. [Arch. Zool. Italiano] 18: 247-263, ill. **Thienemann & Mayer.**—Chironomiden-Metamorphosen. VI. Die metamorphosen zweier hochalpiner Chironomiden. [34] 103: 1-12, ill. **Walker, E. M.**—On the anatomy of Grylloblatta compodeiformis. [7] 26: 309-344, ill.

ARACHNIDA AND MYRIOPODA.—***Bryant, E. B.**—New and little known spiders from the United States. [Bull. Mus. Comp. Zoöl.] 74: 171-193, ill. ***Chamberlin, J. C.**—Some false scorpions of the atemnid subfamily Miratemninae. (Chelonethida). [7] 26: 262-269, ill. ***Davis, N. W.**—A new Opilionid from Florida (Cyphophthalmi). [6] 41: 49-52, ill. ***Dunn, L. H.**—Two new sps. of ticks from Panama. [Parasitology] 25: 353-358, ill. **Ewing, H. E.**—Afield with the spiders. [Nat. Geog. Mag.] 64: 163-194, ill. ***Gertsch, W. J.**—New genera and species of North American spiders. [40] 636: 28 pp., ill. ***Gertsch, W. J.**—Diagnoses of new American spiders. [40] 637: 14 pp., ill. **Marshall, R.**—Preliminary list of the Hydracarina of Wisconsin. [Trans. Wisconsin Acad. Sci. Arts & Let.] 28: 37-60, ill. **Passmore. L.**—California trapdoor spider performs engineering marvels. [Nat. Geog. Mag.] 64: 195-211, ill. **Störmer, L.**—Are the trilobites related to the arachnids? [16] 26: 147-157, ill. ***Viets, K.**—Neue Hydrachna-und

Eylais-arten (Hydrachnellae, Acari) aus Porto Alegre, Brasilien. [34] 103: 161-171, ill.

THE SMALLER ORDERS OF INSECTS.—***Bird, R. D.**—Somatochlora ozarkensis, a new species from Oklahoma (Odonata-Cordulinae). [Occas. Papers Mus. Zool. Univ. Michigan] 261: 1-7, ill. ***Jordan, K.**—Four new fleas collected by F. Spillmann in Ecuador. Two new South American bird-fleas. [71] 38: 343-348; 358-361, ill. **Klein, B. M.**—Beobachtungen an Odonaten. [97] 52: 709-715, ill. **MacLagan, S.**—(See Anatomy, Physiology, etc.) ***Navas, L.**—Insectos de la Argentina y Chile. [104] 5: 79-86, ill. ***Navás, L.**—Décadas de insectos nuevos. [Brotéria] 29: 101-110, ill. (S). ***Navas, Longino.**—Neurotteri e Tricotteri del "Deutsches Entomologisches Institut" di Berlino-Dahlem. [27] 65 (5): 105-113, ill. **Needham, J. G.**—A stonefly nymph with paired lateral abdominal appendages. [13] 25: 17-18, ill. **Schmidt, E.**—Bibliographia Odonatologica. 1933: 114 pp. **Spieth, H. T.**—The phylogeny of some mayfly genera. [6] 41: 55-86. **Traver, J. R.**—Heptagenine mayflies of North America. [6] 41: 105-125. ***Wagner, J.**—Aphanipteren-material aus der sammlung des Zoologischen Museum der Berliner Universität. [Mitteil. Zool. Mus. Berlin] 18 (3): 338-362, ill. ***Werneck, F. L.**—Nova especia do genero Gliricola (Mallophaga: Gyropidae). [Mem. Inst. Oswaldo Cruz] 27: 147-151, ill. (S). ***Williamson, E. B. and Gloyd, L. K.**—A new Somatochlora from Florida (Odonata-Cordulinae). [Occas. Papers Mus. Zool. Univ. Michigan] 262: 1-7, ill. **Williamson, E. B.**—The status of Sympetrum assimilatum (Uhler) and S. decisum (Hagen). (Odonata-Libellulinae). [Occas. Papers Mus. Zool. Univ. Michigan] 264: 1-8, ill.

ORTHOPTERA.—Beamer, R. H.—Collecting Grylloblatta campodeiformis var. occidentalis. [7] 26: 234-237, ill. **Crampton, G. C.**—The affinities of the archaic orthopteroid family Grylloblattidae, and its position in the general phylogenetic scheme. [6] 41: 127-166. **Faure, J. C.**—The phases of the Rocky Mountain locust Melanoplus mexicanus. [12] 26: 706-718, ill. ***Hebard, M.**—Notes on Panamanian Dermaptera and Orthoptera. [1] 59: 103-144, ill. **Kästner, A.**—Die Hexacentrinae des Stettiner Museums. [60] 94 (1): 21-46, ill. (S). ***Liebermann, J.**—Dos nuevas especies de Marellia. Marellia paranaensis y Marellia gemignanii. [104] 5: 109-116, ill. (S). **Thomas, E. S.**—Neoconocephalus lyristes in the middle west (Tettigoniidae). [7] 26: 303-308, ill. **Vayssière, P.**—La lutte contre les sauterelles; son or-

ganisation internationale. Observations biologiques sur le criquet migrateur et le criquet pèlerin. [C. R. Acad. d'Agric. de France] XIX (22): 801-810.

HEMIPTERA.—Ancona, L.—Los jumiles de Cuautla. (Euchistus zopilotensis). [An. Inst. Biol., Mexico] 4: 103-108, ill. ***de Carlo, J.**—Nuevas especies de Belostomidos. [104] 5: 121-126, ill. (S). ***Gillette & Palmer.**—New species of aphids from Colorado. [7] 26: 348-367, ill. **Prebble, M. L.**—The biology of Podisus serieventris in Cape Breton, Nova Scotia. [Canadian Jour. Res.] 9: 1-30, ill. **Rawitscher, F.**—Wohin stechen die pflanzenläuse? [Zeitschrift für Botanik, Jena] 26 (4): 146-168, ill.

LEPIDOPTERA.—*Breyer, A.—Castnia jorgenseni, nueva especie de la Republica Argentina. [104] 5: 207-208, ill. ***Le Cerf, F.**—Formes nouvelles de Lépidoptères Rhopalocères. [Bull. Mus. Nat. Hist. Nat. Paris] 5: 212-214. (S). **Comstock & Dammers.**—Notes on the life histories of four Californian lepidopterous insects. [38] 32: 77-83, ill. **Haller, M. S.**—Luna, queen of the evening emergences. [Nature Mag.] 22: 71-73, ill. ***Hayward, K. J.**—Lepidopteros Argentinos. [104] 5: 149-188, ill. ***Hayward, K. J.**—Notas adicionales acerca de los Nymphalidae Argentinos. [104] 5: 213-218, ill. **Hering, M.**—(See General). **Hormuzachi, C.**—Desusiri asupra teoriilor despre evolutiunea Lepidopterelor europene. [Bul. Fac. Stiinte din Cernauti] 5: 271-283. **McClure, H. E.**—Unusual variation in the life cycle of the male of Aenoplex carpocapsae, codling moth parasite. [7] 26: 345-347, ill. **Ohara, K.**—Studien über den feinbau der seide. [Scien. Papers Inst. Phys. Chem. Res., Tokyo] 21 (431-434): 104-127, ill. **Orfila, R. N.**—Estudios de Lepidopterologia Argentina. Catalogo sistematics de los Sphingidae. Adicion al catalogo de los Lepidopteros Argentinos. [104] 5: 190-206, 209-212. **Querci, O.**—An account of my studies in the biology of Pieris rapae. [21] 45: 65-70. **Richards, A. G.**—Morphology of the female reproductive system of Incurvaria russatella. [6] 41: 167-184, ill. **Rocci, U.**—La struttura e la variabilità delle armature maschili in alcuni gruppi specifici del gen. Melitaea (Nymphal.). [Mem. Soc. Ent. Italiana] 11: 123-161, ill.

DIPTERA.—Alexander, C. P.—Undescribed species of Eriopterine crane-flies from the United States and Canada (Tipulidae). [6] 41: 91-100. ***Bequaert, J. C.**—(See under General). ***Bequaert, J.**—Notes on the Tabanidae described by the late C. P. Whitney. [Occ. Pap. Boston Soc. Nat. Hist.] 8: 81-88. **Copello, A.**—Biologia de Hyperalonia

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HUGH SCOTT. GENERAL CONCLUSIONS REGARDING THE INSECT FAUNA OF THE SEYCHELLES AND ADJACENT ISLANDS. Trans. Linnean Soc. London xix, Part 3. (March, 1933). pp. 308-391.—Many years ago it was recognized that the faunae of remote islands were of extraordinary interest to students of geographical distribution and evolution; and furthermore, that if collections were not made in the near future, many of the inhabitants of these islands would be lost for ever, having disappeared as a result of human occupation. The dodo, the history of which is familiar to every one, is but an example of the sort of thing which has happened or is happening on almost all islands possessing endemic species. Accordingly, a

Committee was appointed under the auspicies of the Royal Society of London, the British Association for the Advancement of Science and the Bishop Museum at Honolulu, to explore and report on the Zoology of the Hawaiian Islands. The resulting publications, issued under the title *Fauna Hawaiiensis,* were recognized as representing a contribution to zoological science of the first magnitude, and a source of information and inspiration to all subsequent generations of zoologists. It was evident, however, that the Hawaiian group was in many respects unique and so far from settling the problems connected with insular faunae, strongly suggested the importance of investigating other islands or groups of islands. It would be through comparisons of the various results thus attained that some of the most important and interesting generalizations could be made. Attention was directed to the Seychelles group in the Indian Ocean. The Zoology of these islands was briefly discussed by A. R. Wallace in *Island Life* (second edition, 1892, Chap. xix), and the conclusion reached that "we have the fragments of a very ancient island, which may perhaps never have been continental." The insect fauna was evidently very little known, and owing to the great number and variety of insects, it seemed that an entomological expedition was particularly desirable. Accordingly, with the aid of the Percy Sladen Trust, Dr. Hugh Scott and others visited the islands, and made a very careful investigation of the insects. Dr. Scott spent eight months, working hard; and being already a skilled and experienced collector, he secured an immense amount of material. It was roughly estimated that there were fifty thousand specimens. This was a great achievement, but equally great was that of getting practically all the material worked up, by Dr. Scott himself in the groups of beetles with which he is especially familiar, and by numerous other specialists in other groups. In all, eighty-three reports were published, and the whole results are fairly to be compared with those given in the *Fauna Hawaiiensis.* As an example of constructive, purposeful entomology, it would be hard to find anything better. Two hundred and thirty-three genera and 1423 species were described as new, these including a certain number from the Aldabra group, north of Madagascar. It is impossible in a brief space, to review all the conclusions derived from or suggested by these reports. Comparing the Seychelles group (about 160 square miles) with the Hawaiian Islands (about 7000 square miles) we find:

. Seychelles. 2090 species (1366 believed endemic)
1217 genera (215 believed endemic)

Hawaiian Islands. 3115 species (about 2726 regarded as endemic)
613 genera (178 endemic)

Necessarily, these figures will be altered greatly as the result of future work, thus it is estimated that not more than about half the existing insect fauna of the Hawaiian Islands is known. Nevertheless, it is quite certain that the main statistical features will stand, and represent positive facts. How are we to interpret these facts?

Probably we may classify insular faunae on the following basis:

A. Very ancient islands, with a high percentage of endemic genera and species.
   1. Oceanic islands, with comparatively few genera, and various important families wholly absent. Species often very numerous and closely allied. Example: Hawaiian Islands.
   2. Islands with old continental connections, hence very many genera, and fewer species per genus. Example: Seychelles, New Caledonia. Using this classification, a good argument can be made for the continental origin of the Madeira Islands.*

B. Relatively recent islands, with a much smaller percentage of endemic forms, or sometimes hardly any.
   1. Oceanic islands, with a small fauna, usually now consisting principally of species introduced by man. Examples hard to demonstrate, but doubtless can be found.
   2. Islands with continental connections, and a fauna almost identical with that of the adjacent continent. Examples: Tasmania, Ireland, Formosa.

On some such basis we may perhaps determine rather exactly the past history of an island, and at the same time get some idea of the rate of evolution of different forms of life. There are various modifying factors to be taken into account. Thus, for example, Formosa is mountainous, and no doubt the fauna of its higher altitudes was largely differentiated before the separation from China occurred. Tasmania contains some distinct animals, which are evidently relics of a time prior to its separation, but have died out in Australia. In some cases,

* A new analysis of the Madeira fauna is perhaps called for. The extreme poverty of various groups (*e. g.*, Buprestidae, Elateridae, Scarabaeidae) is very striking. Buprestidae are now extremely numerous and varied in North Africa. Madeira appears to have no native ants. For an argument against the continental origina of the Madeiras, see Nature, April 8, 1922, p. 446.

oceanic islands have been so completely overrun by rats or other pests, that it is difficult to find the original inhabitants, most of them having been exterminated. Sometimes, as in the case of New Caledonia, there is reason to believe that there have been great changes of level, at one time increasing the land area, at another reducing it to a relatively small amount. As a consequence of this many species may have been exterminated long ago.

Dr. Scott remarks that there is no evidence that the Seychelles originated "before all the orders of living insects were differentiated." On the contrary, many modern genera were evidently already in existence, but we know from the fossils that many genera of insects are of enormous antiquity. The early continental connection was surely with Asia. The resemblances to the Ethiopian fauna, such as they are, may be readily explained by the survival in Africa of various genera once also living in Asia. The wider distribution of many groups now exclusively African is well known to paleontologists. The total absence of several important groups (*e.g.*, the sawflies) in the Seychelles is surprising, but does not indicate that they were not in existence when the islands were formed. The islands are mountainous, with elevations up to nearly 3000 feet, but it is possible that the elevations at some former period were not so great. Also, no doubt, they have been greater, but presumably never comparable to those of the Hawaiian Islands. Nearly all the apparently endemic genera and species were found in the small areas, totalling about five square miles, where the ancient forest still survives. It is easy to imagine the losses to fauna and flora resulting from this restriction of the original forested area. We are indeed amazed that under such conditions Scott was able to discover such a large and varied insect fauna.

This discussion does scant justice to Scott's paper, the study of which may be commended to every entomologist who is interested in the larger aspects of his science.

T. D. A. COCKERELL.

FIGHTING THE INSECTS: the Story of an Entomologist. By L. O. HOWARD. The Macmillan Company. 333 pages. 1933. $2.50.—This is Dr Howard's own story, told humorously, genially and modestly, and is both romantic and dramatic. He tells of his boyhood in Ithaca, his days at Cornell University, his growing interest in insect life, his work, from 1878 to 1931, first as Assistant Entomologist and later as Chief of the Bureau of Entomology. He writes in popular vein of his scientific

work, avoiding all technicalities, and making the gipsy moth, the mosquito, and the silk worm equally delightful to read about. He tells lively stories of his travels in many lands and of a host of notable scientists and public men whom he has met. Dr. Howard says that an entomologist is still a queer fellow in the eyes of many, but he is really very much like other people. Very likely people might find the story of an entomologist—that is, an average typical entomologist—interesting; but the particular entomologist who writes this, being perhaps more like the average man than is the average entomologist, has had the good luck to be thrown into positions in which he has been able to draw forcible attention to the insect problem, since he has in the course of the years taken part in many investigations that have been successful and have proved useful to all humanity. So why should not his life be interesting? This book will be found interesting, not only to those who know Dr. Howard personally and to entomologists in general, but to others who find entertainment in reading of the lives of useful men; and its moderate price brings it within the reach of all.

[E. T. C. Jr.]

MEDICAL ENTOMOLOGY. A survey of insects and allied forms which affect the health of man and animals. By WILLIAM A. RILEY, University of Minnesota, and OSKAR A. JOHANNSEN, Cornell University. First edition McGraw-Hill Book Co., Inc., New York and London, 1932. Pp. xi, 476, 184 figs. and frontispiece, $4.50.

MEDICAL ENTOMOLOGY. By ROBERT MATHESON, Cornell University. Springfield, Illinois & Baltimore, Maryland. Charles C. Thomas, 1932. Pp. xiii, 489, 211 figs. and double frontispiece. $5.00.

It is not often that two different books under the same title by two members of the same faculty appear about the same time, but such is the case in the present instance. It is natural, on reading the names of the authors of the first volume, to recall their earlier work on this subject, reviewed in the NEWS for May, 1915, and to assume that their present work may be merely a slight revision of their previous text. This is far from being the case. They do indeed speak of it, in the preface, as a revision, but at once explain that they have so recast the material as to arrange it in a systematic order. After a brief historical chapter and a second summarizing the ways in which Arthropods may affect the health of man and animals, the arrangement is strictly taxononic. We still think, as we did in 1915, that this is preferable to the ecological arrange-

ment adopted in their volume of that year. The sequence which they here follow is: Crustacea, Arachnida, Myriopoda, Insecta. An appendix deals with hydrocyanic gas fumigation against household insects.

Prof. Matheson likewise begins with a chapter embracing a brief historical account and some generalities on insect-borne diseases and then follows a taxonomic arrangement whose sequence is Crustacea, Arachnida, Insecta. His nineteenth chapter, Poisonous and Urticating Arthropods, contains nearly all that he has to say on Myriopods, Coleoptera, Lepidoptera and Hymenoptera, while certain Arachnida and mosquitoes find a place here also. The last chapter is on collecting, preserving, mounting, dissecting and rearing insects. The Orthoptera are practically omitted from the book.

Matheson makes greater provision (32 pages, 25 figures) for those users of his book whose knowledge of insect structure in general is scanty than do Riley and Johannsen (16 pages, 4 figures). The latter authors employ only the Comstock-Needham nomenclature of wing-venation; Matheson gives both this and also that which is widely used by writers on Diptera, as by Williston in his *Manual*. Both volumes contain numerous keys for identification of Arthopods; those in Riley-Johannsen are in most cases fuller in characters employed and include a greater number of genera, families, or other taxonomic divisions. Thus, Matheson's 1 page key to Culicidae is for 11 genera, and the key to the species of *Anopheles* (pp. 237-238) embraces those of the Americas only. Riley-Johannsen give a two page key to 41 genera and 12 pages to keys for the species of *Anopheles* of the entire world, grouped by continents. Yet 36 species of *Aedes* appear in Matheson's index to 5 in the other work. Both books give extensive, selected bibliographies; Matheson places them at the end of each corresponding chapter; Riley-Johannsen has one comprehensive list at the end of the volume.

P. P. CALVERT.

HOUARD, C., (preface par E. L. BOUVIER). LES ZOOCECIDIES DES PLANTES DE L'AMERIQUE DU SUD ET DE L'AMERIQUE CENTRALE. 1-546 p. Map, 1027 fig., Hermann et Cie: Paris, 1933, Pr. 120 fr.—This general summary of the gall fauna of South and Central America is the first comprehensive tabulation we have had of this comparatively unknown and most interesting fauna. The author, exceptionally well equipped through his preparation of five similar volumes on the galls of the Mediterranean region, Asia, Africa and Oceania, has followed the same general plan in this work. It is a descriptive, admirably illustrated list of plant galls, arranged in a botanical sequence. There

are 1,341 deformities described from 98 plant families. The general discussion of the galls as a whole and of those of each of the families add greatly to the value of the work. The descriptions of the individual galls are accompanied by citations, making it comparatively easy, in connection with the extensive bibliography, to ascertain further details in regard to any species or group. The tabulated matter respecting the gall makers and their hosts greatly aids a comprehensive view of the whole.

The fact that but 229 species are definitely associated with the deformities they produce indicate there is much to be learned in regard to this fauna with its known 1,341 galls, the latter by no means representing the whole number. The gall midges are responsible for over 50% of the deformities produced by identified species and this ratio is not far from that of the gall faunae of Dutch East Indies, the Mediterranean region, North America and Central Europe as indicated by earlier published works. The 20 psyllid galls make a relatively poor showing compared with the 145 recorded from the Dutch East Indies and the 19 deformations produced by gall mites are a mere drop in the bucket compared to the 355 recorded from the Dutch East Indies and 263, 162 and 196 listed respectively from the Mediterranean region, North America and Central Europe. The other identified gall makers are represented by even fewer species.

A comparison between the gall makers and their host preferences also shows interesting conditions. The 164 galls in the Composites compare favorably with the 181 and 182 recorded in earlier lists from Asia and North America, through decidedly low for the 660 listed from the Mediterranean region. The 48 galls of the Spurge family are low for the 129 listed from Asia and also from the Dutch East Indies, though they compare favorably with the 43 from the Mediterranean region. The 39 galls listed from the Madder family are small compared with the 91, 71 and 160 recorded from Asia, Dutch East Indies and the Mediterranean area respectively. There is a closer approximation in the fauna of the Laurel family, 36 galls being recorded in this work and 53 and 48 from Asia and the Dutch East Indies respectively. The 16 galls in the Beech family and the 14 in the Rose family present marked contrasts to conditions recorded for these groups in Asia, the Mediterranean region and North America respectively.

The author is to be congratulated upon the preparation of such a satisfactory volume which cannot prove otherwise than an invaluable guide to all future students of plant deformities in that section of the world. E. P. FELT.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

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